

**IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF DELAWARE**

BECKMAN COULTER, INC.,

Plaintiff,

v.

DEFENDANT CYTEK  
BIOSCIENCES, INC.,

Defendant.

C.A. No. 24-0945-CFC-EGT

**REDACTED PUBLIC VERSION**

**PLAINTIFF BECKMAN COULTER, INC.'S  
SUPPLEMENTAL CLAIM CONSTRUCTION BRIEF**

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<b>Exhibit No.</b>	<b>Description</b>
A	Plaintiff's Markman Presentation (Aug. 21, 2025)
B	Excerpts from Exhibit B to Plaintiff's Infringement Contentions, dated February 14, 2025
C	Examiner Interview Summary
D	Declaration of Dr. David Schaafsma In Support of Beckman Coulter's Supplemental <i>Markman</i> Brief

## I. NATURE AND STAGE OF PROCEEDINGS

This is a direct competitor case in which Plaintiff Beckman Coulter, Inc. (“Plaintiff” or “BEC”) is asserting four patents marked on and practiced by its flagship CytoFLEX line of flow cytometers. The CytoFLEX was the “first commercially available instrument utilizing Avalanche Photodiodes (APDs) for detectors rather than traditional PMT.”<sup>1</sup> The specifications of the Asserted Patents expressly discuss how one of the advantages of the various exemplary WDM architectures described in the patents is that they “easily” allow for the use of “small area APDs.” ’582 Patent<sup>2</sup> at 45:49-54; 46:27-29; *see also* Joint Claim Construction Brief, Dkt. 114 (“Br.”) 2-4, 8-9.

The Court held a *Markman* hearing on August 21, 2025, in connection with the parties’ claim construction disputes and issued certain rulings in connection with

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<sup>1</sup> Ex. A (BEC Markman Hearing Presentation) at 4-11; *see also* <https://www.beckman.com/resources/videos/scientific/avalanche-photodiodes-in-cytoflex>.

<sup>2</sup> Because the Asserted Patents share a common specification, citation to the ’582 Patent specification should be understood to encompass the corresponding portions of the specifications in the other Asserted Patents. BEC’s supplemental brief is also supported by the Declaration of Dr. David Schaafsma in Support of Beckman Coulter’s Supplemental Markman Brief, Ex D. All emphasis, unless otherwise noted, has been added.

the term “first and second filter,”<sup>3</sup> the collimating-related terms (“collimate,” “collimating,” “collimated beam”), and “optical element configured to detect” in claim 13 of the ’443 Patent. August 21, 2025 Hrg Tr. 72-74, 133-135, 178-79. The Court set a follow-up *Markman* hearing on September 17, 2025, and invited further briefing in connection with the following:

- The Court changed the disputed term “first” / “second” to “disputed terms,” plural, noting that the parties may not have “addressed the meaning” of each of “the sub-terms of the first and the sub-terms of the second” and invited the parties to submit briefing as to each of the sub-terms. *Id.* 72-74.

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3 [REDACTED]



- As to “optical element configured to detect” in claim 13 of the ’443 Patent, the Court invited the parties to submit briefing as to the structure that the Court found corresponded to the claimed function—elements “408 and/or 413”—specifically, whether both elements are required or whether either one is sufficient to perform the claimed function. *Id.* 192-193.
- With respect to the “optical element” terms—“optical element configured to detect” in claims 17 and 18, “collimating optical element,” “collecting optical element,” and “focusing optical element,” the Court invited briefing on the corresponding structure for each of those terms, which the Court found were means-plus-function. *Id.*

BEC respectfully submits this supplemental claim construction brief in response to the Court’s invitation.

## II. DISPUTED CONSTRUCTIONS

### A. “first”/“second”

#### 1. Relevant Legal Standards

The Federal Circuit has repeatedly affirmed—and district courts have routinely applied—the basic principle that the “use of the terms ‘first’ and ‘second’ is common patent-law convention to distinguish between repeated instances of an element” and “should not” be construed to impose any serial, sequential, temporal,

or spatial location. *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003) (no “serial or temporal limitation,” no “sequential limitation”); *Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005) (“‘first, second, and third’ are terms to distinguish different elements of the claim … [that] need not necessarily appear in that order”); *Free Motion Fitness, Inc. v. Cybex Int'l, Inc.*, 423 F.3d 1343, 1348 (Fed. Cir. 2005); (“[f]irst’ does not denote spatial location”). The Federal Circuit has analogized the use of the terms “first” and “second” to the use of “A” and “B”. *3M*, 350 F.3d at 1371 (“first … pattern” and ‘second … pattern’ is equivalent to a reference to ‘pattern A’ and ‘pattern B’”). There is no Federal Circuit case that BEC is aware of—and Cytek cites none—in which “first” and “second” were found to require serial, sequential, or other ordering. Thus, as a default and presumptive matter, the use of the terms “first” and “second” are given their ordinary meaning and scope in patent law to distinguish between repeated instances of an element.

Cytek argues that “*3M* applies in the absence of intrinsic support, so it is inapposite.” Br. 20. That is wrong and, in fact, the *opposite* of what the Federal Circuit requires. In describing the circumstances under which the intrinsic evidence may displace the basic conventional usage of “first” and “second” in patent claims, the Federal Circuit has explained that the convention and ordinary scope of the claims should be displaced *only if* the “intrinsic evidence of the patent *requires* that

a limitation of sequential” ordering should narrow the claims, *3M*, 350 F.3d at 1374, for example, ““words or expressions of manifest exclusion’ or ‘explicit’ disclaimers in the specification are necessary to disavow claim scope,” *Gillette*, 405 F.3d at 1374. Thus, it is Cytek’s burden to show that the intrinsic evidence *requires* narrowing the claims to specific ordering or sequence, not merely to point to *some* “intrinsic support” for its position.

That is because, in conducting this inquiry, it is not relevant even if the specification “recurrently recites serial application” or there are “numerous references to a preferred embodiment of the invention” that might be viewed as narrower than the ordinary conventional scope of the claims. *3M*, 350 F.3d at 1374; *Gillette*, 405 F.3d at 1374. The conventional usage of “first” and “second” in the claims remains subject to one of the cardinal rules of claim construction that “limitations from the specification … cannot be imported into the claims,” and the court should not “limit[] the claimed invention to preferred embodiments or specific examples in the specification.” *3M*, 350 F.3d at 1372; *Gillette*, 405 F.3d at 1374. And it is for that reason that the Federal Circuit has instructed that, in order for the conventional usage to be displaced, the intrinsic evidence must “*require*[] … a limitation of sequential” ordering. *3M*, 350 F.3d at 1372 (emphasis added); *see also Gillette*, 405 F.3d at 1374.

This case is the opposite of Cytek’s cited case, *Tigo*, Br. 13, 21, where the claim limitation was “convert the first output to a second output,” and where Judge Williams found that ordering was “a key characteristic of the invention” and “‘first’ and ‘second,’ appear numerous times in the ... Patent and, in each instance, the terms are used to establish an order.” *Tigo Energy Inc. v. SMA Tech. Am. LLC*, 2023 WL 8370147, at \*8 (D. Del. 2023). As explained further below, there is no evidence here that the invention requires “first” and “second” to be interpreted in any particular way, the specification uses “first” and “second” in dozens of instances **not** to “establish an order,” and the terms “first” and “second”—even as applied to elements of the WDM—are used synonymously with “another” or “additional” and merely refer to different elements of the same kind.

In Cytek’s other case—*Applera*, Br. 13, 17—the district court rejected the notion that “first” means “preceding all others in time, order, or importance,” “second” as “next to the first in place or time,” and the notion that those terms conveyed “absolute position.” *Applera Corp. v. Micromass UK Ltd.*, 186 F. Supp. 2d 487, 504-08 (D. Del. 2002). Instead, the *Applera* court held that there was prosecution history disclaimer and that, based on the intrinsic evidence in that case, “first” and “second” only imparted “relative position” such that “regardless of how many [elements] there might be in the structure and where they are, the invention only requires that ‘first’ come before ‘second.’” *Id.* at 507. And the court’s

construction was “‘first’ is construed to mean ‘an element,’ ‘second’ is construed to mean ‘an element coming after, in the path of ion travel, the first such element.’” *Id.* As explained further below, that approach conflicts with at least some of the claims in which the claimed second element(s) actually comes before—not after—the first such element.

## **2. Overview of Claims and Specification**

BEC’s proposals are faithful to the conventional use of “first” and “second” in patent law, drawn directly from the claims as written, and find direct support in the written description and intrinsic evidence. The claims and specification make clear that the usage of “first” and “second” is not limited to describing sequence in the optical path but instead to merely distinguishing similar elements in the overall hardware configuration. *See Ex. D (Schaafsma Supp. Decl.) ¶¶ 11-22.*

With respect to the claims, there is no express language in the claims requiring that “first” necessarily be interpreted as “initial … in the optical path through the WDM” and “second” be necessarily interpreted as “second sequential in the optical path through the WDM.” Those phrases do not appear in the claims; nor is there any other language that could be interpreted as requiring as such. As explained in BEC’s brief, there is *different* claim language—other than “first” and “second”—that impart positional significance, *e.g.*, “initial,” “followed by,” “after,” “towards.” Br. 10-12, 17-18. And where the claims seek to identify the claim elements by their position

or location in the “optical path” (as opposed to, for example, simply identifying different elements in the hardware generally) they do so expressly, *e.g.*, ’582 Patent at cls. 6, 10, 18, 19; ’443 Patent at cls. 4, 8, 9; ’107 Patent at cls. 5, 21. Indeed, as explained in further detail below, there are at least two instances in which the claims require the “second” element to come before the “first”—in claim 12 of the ’582 Patent, “the first image is a reimage of the second image”; and in the ’582 Patent claims generally, the “second focusing optical element” comes before the “first focusing optical element.” Defendant’s proposals would affirmatively negate all of that claim language and improperly rewrite the claims.

As to the written description, the specification *never* uses the terms “initial,” “sequential,” “through the WDM” or “optical path through the WDM” at all, much less to refer to any element of the described WDMs. Nor has Cytek pointed to any statement of the invention, definition, disclaimer or other narrowing that would *require* those concepts to be imported into the claims.

Indeed, in the specification, the overwhelming usage of the words “first” and “second” is to refer to multiple instances in a group. For example, the specification repeatedly uses the terms “first” and “second” in a non-sequential manner to refer to, *e.g.* “zones,” “fractions,” “branches,” “surfaces,” “light source,” “location,” “beam path,” “outlet,” “detection systems,” and “beam.” *See, e.g.*, ’582 Patent at 3:40-45, 5:23-65, 6:7-62, 7:10-55, 8:12-34, 9:26-33, 9:27-32, 17:15-20, 17:56-61,

21:57-67, 26:48-54, 50:15-67, 57:4-14, 58:24-30. In explaining detection systems 408 and 413, the specification describes “a second light detection system 413” that optically precedes the other detection system 408. ’582 Patent at 53:50-54:11, Figures 37-38. In describing the power monitoring subsystem, the specification describes first, second, and third dichroic filters, but the “first” filter is actually the last in the optical path, and the third (or second) are the first in optical path. ’582 Patent at 5:23-46; 50:15-51:25, Figures 34-35. In describing the WDM, the specification describes three components in an optical path—“a first optical element,” “a least one dichroic filter,” and “a second optical element”—and, given that the dichroic filter is unquestionably an optical element, the passage therefore refers to the *third* optical element in the path as the “second optical element.” *Id.* at 6:39-50, 44:58-45:17. Also in describing the WDM, the specification even equates the use of “second” with “additional,” affirmatively negating the notion that “first” and “second” mean sequential. For example, in describing element 908 in Figure 25, the specification variously uses the terms “an additional focusing optical arrangement 908” and “a second focusing lens 908.” ’582 Patent at 45:20-26, 58:2-9. Likewise, in describing element 909 in Figure 25, the specification variously uses the terms “an additional dichroic filter arrangement 909” and “a second dichroic filter 909.” ’582 Patent at 45:32-35, 57:57-65.

Thus, the intrinsic evidence does not affirmatively require that “first” and “second” is limited to describing sequential elements in the optical path; in fact, the intrinsic evidence is quite clear that “first” and “second” are broadly used to distinguish similar elements in the overall hardware configuration.

**3. “a first” / “a second” “filter” ('443 Patent, claims 9, 10)**

During the August 21, 2025 *Markman* hearing, the Court construed “first and second filters to require that the first filter occur sequentially before or temporally before the second filter.”

**4. “a first curved mirror” ('106 Patent, claim 1)**

The claim recites “a first curved mirror … after … the collimating optical element … configured to reflect … fluorescent light towards the first semiconductor detector, and a first dichroic filter optically disposed between the first curved mirror and the first semiconductor detector.” The claim recites “*a* first curved mirror,” not “*the*” first curved mirror. And while the claim recites “*a* first curved mirror … after … the collimating optical element,” it does not require the curved mirror to be “*the* first … after … the collimating optical element,” which is what Cytek seeks. Given the claim is a “comprising” claim, there can be additional curved mirrors before the claimed “a first” one, including additional curved mirrors that are “after … the collimating optical element” but before the claimed “a first mirror.” *See Gillette*, 405 F.3d at 1373-74. As Federal Circuit precedent repeatedly emphasizes, the

recitation of “a first” element merely indicates an intent to distinguish between multiple elements and does not require ordering; as such, “a first curved mirror” is not necessarily the initial curved mirror “after … the collimating optical element.”

The specification does not use the term “first” in connection with any concave mirrors (or relay elements) in the WDM, including in connection with Figure 25, meaning the specification does not limit the “first curved mirror” to the “initial curved mirror.” ’582 Patent at 4:61-62, 6:39-53, 10:51-65, 12:35-39, 20:18-21:26, 45:16-54, 45:65-46:35, 47:21-31, 57:36-58:44. The intrinsic evidence does not **require** sequence and order of the curved mirror through use of the terms “first” and “second” and, as explained above, the specification affirmatively negates any such requirement. At best for Cytek, the term “first” in the claim may be understood as identifying and associating together a group of elements—“a first dichroic filter … between the first curved mirror and the first semiconductor detector”—into a “first” grouping. *See Free Motion*, 423 F.3d at 1348 (“The correct construction of the word ‘first’ merely associates” two claim elements each of which described as “a first”).

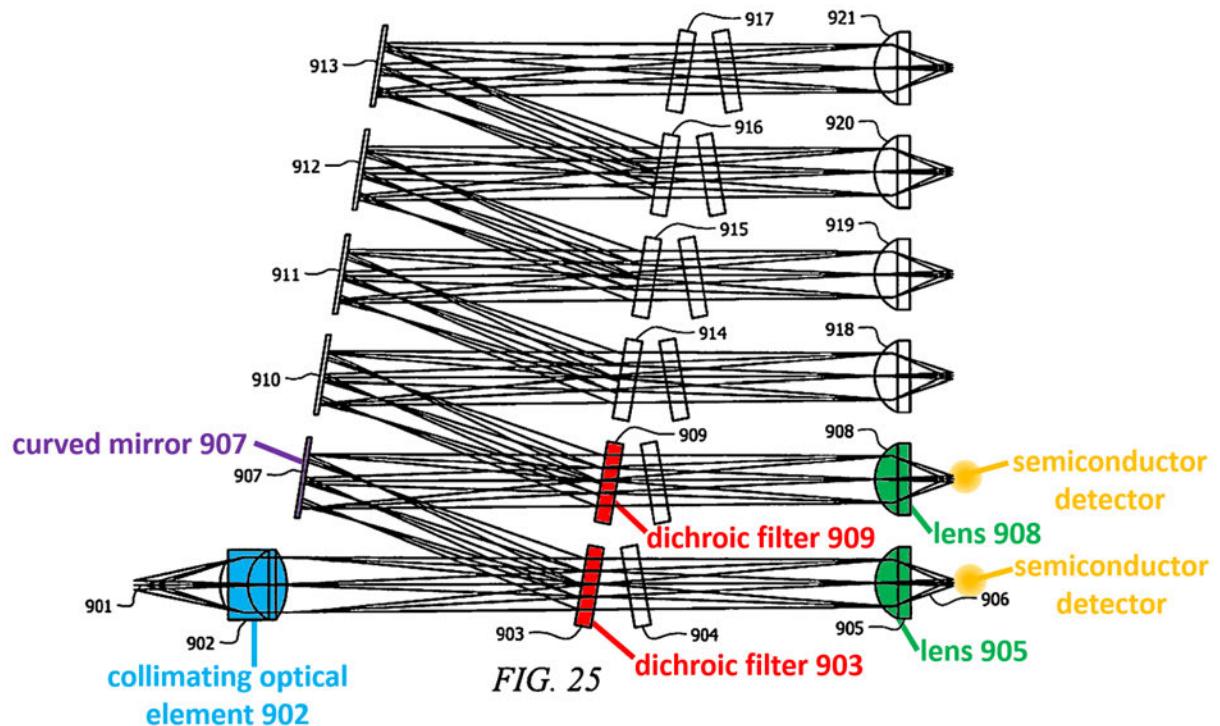
##### **5. “a first dichroic filter” (’106 claim 1):**

The claim recites “a first dichroic filter optically disposed between the first curved mirror and the first semiconductor detector.” The claim recites “**a** first dichroic filter,” not “**the**” first dichroic filter, indicating that the dichroic filter is not necessarily the initial dichroic filter in the optical path of the WDM. Given the claim

is a “comprising” claim, there can be additional dichroic filters before the claimed “a first” one. *See Gillette*, 405 F.3d at 1373-74.

The specification confirms that the claimed “a first dichroic filter” is not the initial dichroic filter in the optical path through the WDM. As noted above, the intrinsic evidence does not *require* sequence and order through use of the terms “first” and “second” and, in fact, the specification affirmatively negates any such requirement, including specifically as to dichroic filters. As also noted above, the specification equates the terms “a second” and “additional” in referring to dichroic filter 909 and also, in the power monitoring system described in the specification, refers to the optically final or last dichroic filter as “first. ’582 Patent, 45:20-26, 58:2-9; *id.* at 5:23-46; 50:15-51:25, Figures 34-35. In describing the dichroic filters in the WDM of Figure 25, the specification uses the terms “a dichroic filter” and “a second dichroic filter” (not “*the* first” or “*the* second”) to introduce the filters and also describes “first dichroic filter” 903 “between” the collimating optical element 902 and semiconductor detector near lens 905 whereas “second dichroic filter” 909 is “between” the concave mirror 907 and the semiconductor detector near lens 908. ’582 Patent at 45:8-13, 45:32-43, 47:11-13. By contrast, the claim here requires “a first dichroic filter … between the first curved mirror and the first semiconductor detector,” *not* between the collimating optical element and the semiconductor detector. Thus, the specification—consistent with the “comprising” language of the

claim—contemplates additional dichroic filters before the claimed “a first dichroic filter.” And because the claim language mirrors the description of the dichroic filter 909 in Figure 25 (and not filter 903), the claimed “first curved mirror,” “first dichroic filter,” and “first semiconductor detector” encompass elements 909, 907, and the semiconductor detector to the right of 908.



BEC’s construction is faithful to the written description, as it would allow the claim to encompass the Figure 25 embodiment, whereas Cytek’s construction would unnecessarily exclude Figure 25 and be limited to embodiments that Cytek has not identified, all in the absence of any intrinsic evidence that *requires* those results. At best for Cytek, the term “first” in the claim may be understood as identifying and associating together a group of elements—“a first dichroic filter … between the first

curved mirror and the first semiconductor detector”—into a “first” grouping. *See Free Motion*, 423 F.3d at 1348 (“The correct construction of the word ‘first’ merely associates” two claim elements each of which described as “a first”).

**6. “a first semiconductor detector” ('106 Patent, claim 1):**

For the same reasons as “a first dichroic filter” above, this limitation also should not be limited to the “initial” semiconductor in the optical path through the WDM, as Cytek proposes. The claim recites “*a* first semiconductor detector” (not “*the*” first), indicating that “a first semiconductor detector” is not necessarily the initial semiconductor detector in the WDM. Given the claim is a “comprising” claim, there can be additional semiconductor detectors before the claimed “a first” one. *See Gillette*, 405 F.3d at 1373-74.

In discussing WDM embodiments with a concave mirror (also called an optical relay),<sup>4</sup> and specifically in connection with Figure 25, the specification describes “a semiconductor detector” 906, “an additional semiconductor” associated with focusing element 908, and “a plurality of semiconductor photo detectors” associated with focusing elements 918 to 921. '582 Patent at 47:15-21, 56:59-64,

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<sup>4</sup> The specification discusses “a first semiconductor detector” and “semiconductor detector” in “one aspect of the disclosure” or “other exemplary embodiments,” but in those disclosures and embodiments, there is no optical relay element, concave mirror, or other “curved mirror” as required by '106 Patent claim 1.

57:9-14, 58:2-19. The specification therefore contemplates that the semiconductor detectors are not ordered or sequenced and evinces intent to merely distinguish between elements (i.e., “additional” semiconductors) in the hardware configuration. The specification also—consistent with the “comprising” language of the claim—specifically contemplates additional semiconductor detectors before the claimed “a first semiconductor detector.” The claim here requires “a first dichroic filter ... between the first curved mirror and the first semiconductor detector,” which means that the claim encompasses elements 909, 907, and the semiconductor detector to the right of 908 respectively.

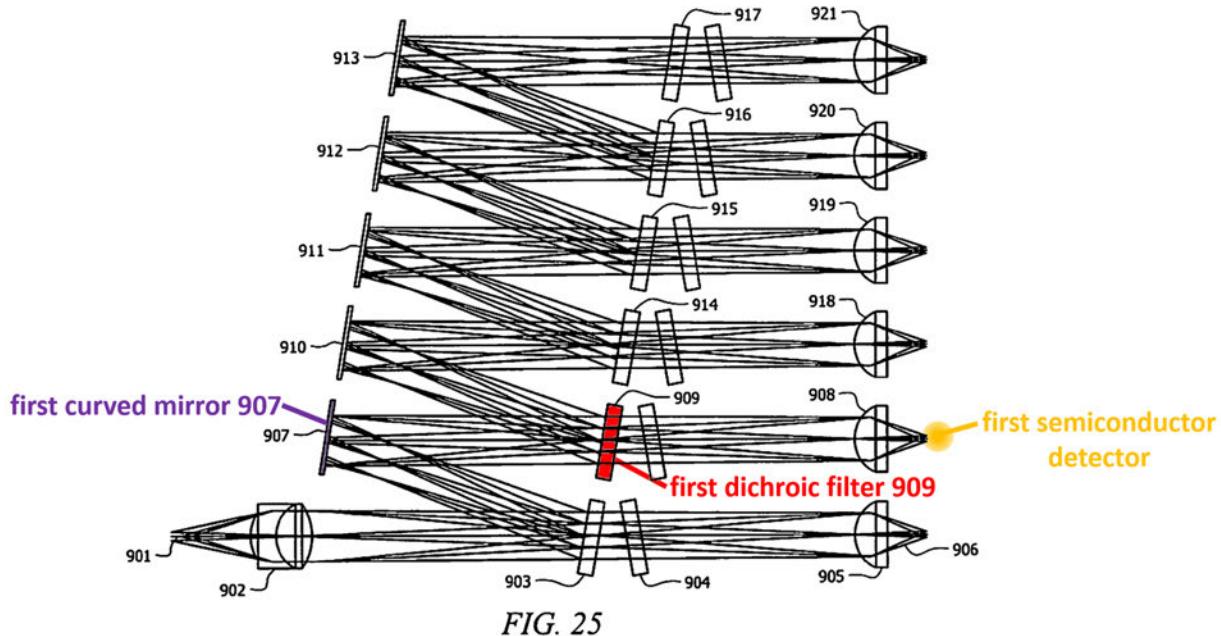


FIG. 25

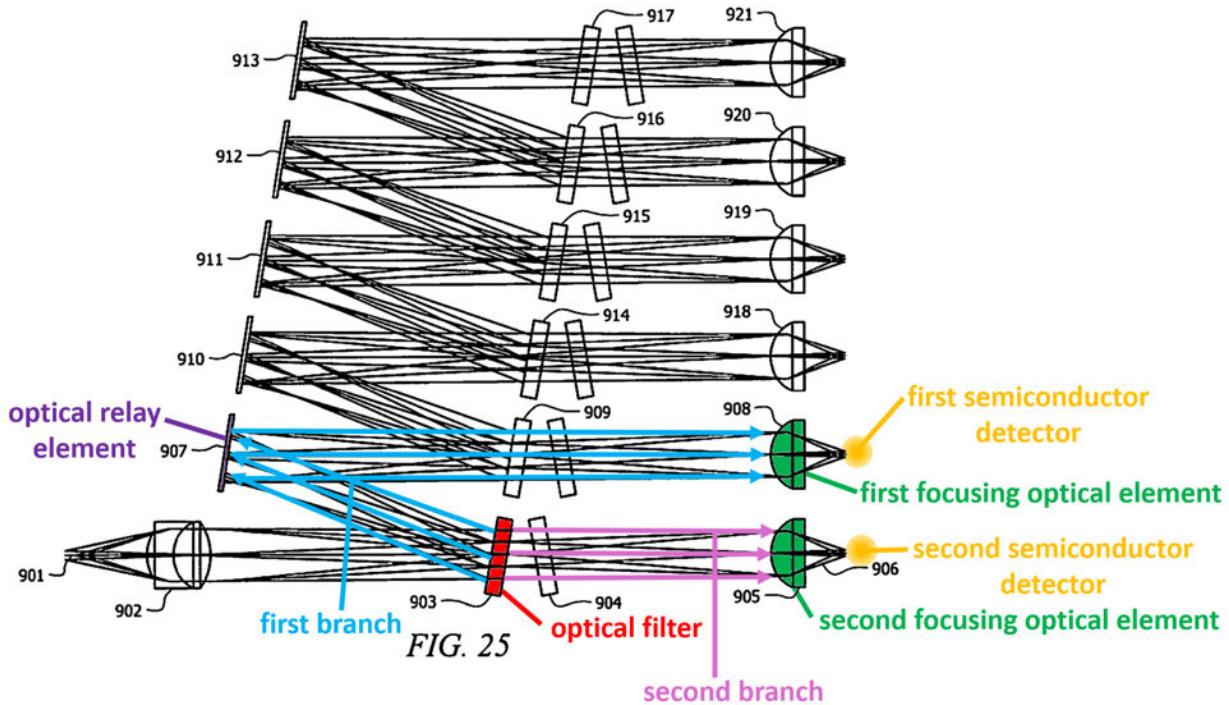
As with “first dichroic filter,” BEC’s construction is faithful to the written description, as it would allow the claim to encompass the Figure 25 embodiment, whereas Cytek’s construction would unnecessarily exclude Figure 25 and be limited

to embodiments that Cytek has not identified, all in the absence of any intrinsic evidence that *requires* those results. At best for Cytek, the term “first” in the claim may be understood as identifying and associating together a group of elements—“a first dichroic filter … between the first curved mirror and the first semiconductor detector”—into a “first” grouping. *See Free Motion*, 423 F.3d at 1348 (“The correct construction of the word ‘first’ merely associates” two claim elements each of which described as “a first”).

**7. “a first”/“a second” “focusing optical element” ('582 Patent claims 1, 3, 17, 18, 26)**

The plain language of the claims requires the *opposite* of what Cytek contends—the claims themselves make clear “a first focusing optical element” is not the initial focusing optical element in the optical path and that “a second focusing optical element” precedes the first. The claims recite (i) an optical filter between a collimating optical element and an optical relay element; (ii) the optical filter separates light into a first branch and a second branch; (iii) the second branch is received by the second focusing optical element and focused onto the second semiconductor detector; and (iv) the first branch is received and reflected by the optical relay onto the first focusing optical element and focused onto the first semiconductor detector. As shown in connection with the elements of Figure 25, the claim itself requires that—because the first focusing element is associated with the “first branch” of light, which progresses further through the WDM and is reflected

by the relay element—the words “first” and “second” cannot convey initial or sequential usage of those terms.



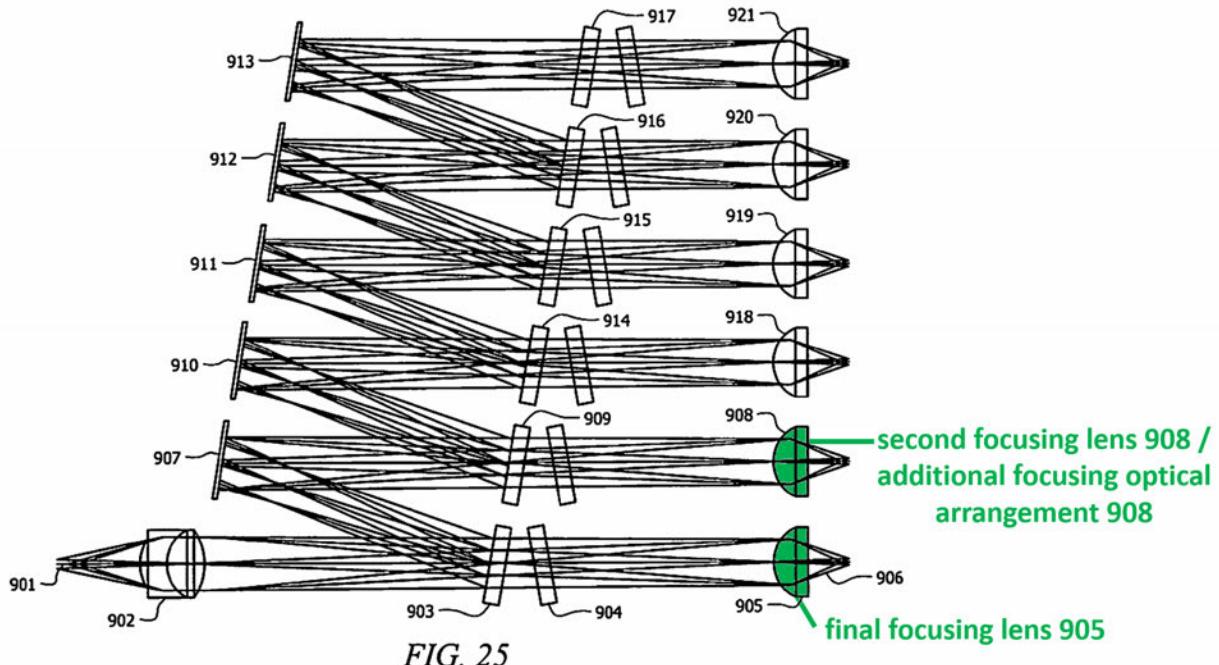
This is, of course, also consistent with the claims reciting “*a* first focusing optical element” (not “*the*”) and “*a* second focusing optical element” (not “*the*”), indicating that focusing elements are not necessarily ordered sequentially.

The specification likewise supports the understanding that “first” and “second” are merely used to distinguish between similar elements in the overall hardware configuration. The specification describes as “second” an optical element for focusing a beam, even though it is actually the third optical element in the beam path (after two other optical elements: (i) a “first optical element” that produces the beam, and (ii) a dichroic filter). ’582 Patent at 6:39-48; 44:58-45:17. In discussing

WDM embodiments with a concave mirror or optical relay,<sup>5</sup> the specification describes “a focusing optical element” to focus one branch of light from a dichroic filter, and “another focusing optical element” to focus the other branch that is reflected by a relay optical element. ’582 Patent at 12:35-49, 20:17-50, 20:64-21:27. The specification therefore contemplates that the focusing optical elements are not ordered or sequenced and evinces intent merely to distinguish between the two elements. In discussing Figure 25, the specification describes a “final focusing lens” 905 and “a second focusing lens 908,” which is also described as “additional focusing optical arrangement 908.” ’582 Patent at 44:58-61, 45:16-21, 58:2-9.

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<sup>5</sup> The specification includes certain discussions of “a first focusing optical element,” but in those disclosures there is no an optical relay element, concave mirror, or other “curved mirror” as required by these claims. ’582 Patent at Abstract, 21:40-48.



The use of the term “final” to describe focusing lens 905 is the *opposite* of Cytek’s construction, which requires that element to be the first sequential (or “initial”) focusing optical element. The use of “*a* second focusing lens 908” (instead of “*the*”) and the characterization of the same element—element 908—as both “a second focusing lens” and “additional focusing optical arrangement” is likewise consistent with the usage merely to distinguish between elements. And given the earlier discussions in the specification referring to “another focusing optical element,” which corresponds to “a second focusing lens 908” and “additional focusing optical arrangement 908,” the specification further reinforces the notion that “first” and “second” are merely being used to distinguish between two or more similar elements.

BEC's construction finds direct support in the specification, and it allows the claim to encompass the Figure 25 embodiment, whereas Cytek's construction unnecessarily excludes Figure 25 and is limited to embodiments that Cytek has not identified, all in the absence of any intrinsic evidence that *requires* those results. At best for Cytek, the claims may be understood as identifying and associating together a group of elements—a “first group” comprising “a first branch” of light, “a first focusing element,” and “a first semiconductor detector” as contrasted with a “second group” comprising “a second branch” of light, “a second focusing optical element,” and “a second semiconductor detector”—into “first” and “second” groupings. *See Free Motion*, 423 F.3d at 1348 (“The correct construction of the word ‘first’ merely associates” two claim elements each of which described as “a first”).

**8.     “a first”/“a second” “semiconductor detector” ('582 Patent claims 1, 17, 18, 26)**

For the same reasons as “a first focusing element” and “a second focusing element,” these limitations also should not be limited to the “initial” and “second sequential” semiconductors in the optical path through the WDM, as Cytek proposes. The claim language expressly requires the opposite—that “a second semiconductor” (associated with “a second branch” and “a second focusing element”) comes before “a first semiconductor detector” (associated with a “first branch” and “a first focusing element”). This is also consistent with the claim reciting “**a** first semiconductor detector” and “**a** second semiconductor detector” (not

“*the*”) indicating that semiconductor detectors are not necessarily ordered sequentially.

In discussing WDM embodiments with a concave mirror or optical relay,<sup>6</sup> and specifically in connection with Figure 25, the specification describes “a semiconductor detector” 906, “an additional semiconductor” associated with focusing element 908, and “a plurality of semiconductor photo detectors” associated with focusing elements 918 to 921. ’582 Patent at 58:2-19. The specification therefore contemplates that the semiconductor detectors are not ordered or sequenced and evinces intent merely to distinguish between the elements.

At best for Cytek, the claims may be understood as identifying and associating together a group of elements—a “first group” comprising “a first branch” of light, “a first focusing element,” and “a first semiconductor detector” as contrasted with a “second group” comprising “a second branch” of light, “a second focusing optical element,” and “a second semiconductor detector”—into “first” and “second” groupings. *See Free Motion*, 423 F.3d at 1348 (“The correct construction of the word ‘first’ merely associates” two claim elements each of which described as “a first”).

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<sup>6</sup> The specification includes certain discussions of “a first semiconductor detector” and “semiconductor detector” in “one aspect of the disclosure” or “other exemplary embodiments,” but in those disclosures and embodiments, there is no an optical relay element, concave mirror, or other “curved mirror” as required by the ’106 Patent claim 1.

**9. “a first optical filter” ('582 Patent claim 6)**

The claim recites “a first optical filter disposed along an optical path between the collimating optical element and the optical relay element.” The claim recites “*a* first optical filter,” not “*the*” first curved mirror; and the claimed “first optical filter” is “*along* an optical path” and not, as Cytek would require, an “initial optical filter *in the* optical path through the WDM.” Given the claim is a “comprising” claim, there can be additional optical filters before the claimed “a first” one. *See Gillette*, 405 F.3d at 1373-74. For the same reasons as “a first dichroic filter,” the Court should find that “first” does not mean initial. As Federal Circuit precedent repeatedly emphasizes, the recitation of “a first” element merely indicates an intent to distinguish between multiple elements and does not require ordering. The intrinsic evidence does not *require* sequence and order through use of the term “a first,” and as explained above, the specification affirmatively negates any such requirement.

**10. “a first image” ('582 Patent claims 1, 14, 15, 20, 21, 22, 25) / “a second image”<sup>7</sup> ('582 Patent claims 14, 15, 20, 21, 26)**

Claim 1 recites “an optical relay element … to produce a first image” (without referring to any “second image,”) and claims 14 and 20 (and their dependent claims)

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<sup>7</sup> While Cytek did not propose construing the term “second image,” Plaintiff includes that term herein given its relevance to the disputes between the parties.

recite “a collimating optical element configured to project a first image” and “[an] optical relay element … to produce a second image.” Cytek’s construction is divorced from the claims because they recite “*a* first image” and “*a* second image (not “*the*”), and nothing in the claims requires “a first image” to be the initial image through the optical path through the WDM and the second image to be the second sequential. The plain language of the claims also contemplates that the image produced by the optical relay element can either be identified as the “first image” (as in claim 1) or the “second image” (as in claims 14 and 20), confirming that “first”/“second” is not intended to identify sequence. Moreover, dependent claim 12 makes clear that the claims contemplate the *opposite* of what Cytek contends because that claim requires “a first image” to be “a reimage of the second image.”

*See Ex. D (Schaafsma Supp. Decl.) ¶¶ 23-26.*

Cytek’s proposal is flawed for additional reasons. Given the claim is a “comprising” claim, there can be additional images formed in the optical path. *See Gillette*, 405 F.3d at 1373-74. For example, claim 1 requires that the “first image” is “produce[d]” by an “optical relay element,” but it does not preclude other components that appear earlier in the optical path (e.g., the “collimating optical element”) from also producing images. Thus, by definition, the “first image” in claim 1 need not be the first sequential image in the optical path because it must be produced by the “optical relay element.”

The specification uses the terms “a first image” and “a second image” to refer to two instances of an image of an object. ’582 Patent at 45:16-43. But in so describing images, the specification does not suggest expressly or impliedly that those are the initial and second sequential images (of any kind) *in the optical path*, nor even that those are the initial and second sequential images of the collimating optical element.

## B. “Optical Element” Terms

### 1. Relevant Legal Standards

Once a claim term is found to be means-plus-function, the Court proceeds to the second step of the of the means-plus-function analysis, in which “[t]he court must first identify the claimed function” and then “determine what structure, if any, disclosed in the specification corresponds to the claimed function.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015). The Federal Circuit has repeatedly emphasized that “[w]hile the specification must contain structure linked to claimed means, this is not a high bar.” *WSOU Invs. LLC v. Google LLC*, No. 2022-1066, 2023 WL 6210607, at \*5 (Fed. Cir. Sept. 25, 2023) (citing *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 950 (Fed. Cir. 2007)).

The Federal Circuit has expressly stated that this inquiry does not “permit incorporation of structure from the written description beyond that necessary to perform the claimed function.” *Micro Chemical, Inc. v. Great Plains Chemical Co.*,

*Inc.*, 194 F.3d 1250, 1258 (Fed. Cir. 1999). Accordingly, “[a] court may not import into the claim features that are unnecessary to perform the claimed function. ... Features that do not perform the recited function do not constitute corresponding structure and thus do not serve as claim limitations.” *Northrop Grumman Corp. v. Intel Corp.*, 325 F.3d 1346, 1352 (Fed. Cir. 2003).

“The corresponding structure to a function set forth in a means-plus-function limitation must actually perform the recited function,” and should **exclude** any limitations or structures that “merely enable the pertinent structure to operate as intended.” *Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1371 (Fed. Cir. 2001) (excluding feature that “enables the ... means to perform its recited functions”). This means that all that is required is the identification of the structure itself that actually performs the function—features that “enable” the function, the “inner” workings of the structure, how it might be “modified to perform” the function, the “details of its operation” need not be specified in the written description or included in the construction. *See Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1338-39 (Fed. Cir. 2008) (discussing cases). For those same reasons, the specific “protocol” or “way” by which the structure performs the claimed function is not relevant to this inquiry. *Asyst Techs., Inc. v. Emtrak, Inc.*, 402 F.3d 1188, 1196 (Fed. Cir. 2005) (“any structure that is the same as, or equivalent to” the identified

corresponding structure infringes, “regardless of whether it performs that function by way of something like the ‘ready, set’ protocol or otherwise”).

The Federal Circuit has likewise rejected efforts to identify corresponding structure that incorporate “specific embodiments of the invention,” particularly where “the written description describes certain implementations” and “expressly notes that other implementations are possible” and “those implementations are not required.” *Univ. of Pittsburgh of Commonwealth Sys. of Higher Educ. v. Varian Med. Sys., Inc.*, 561 F. App'x 934, 941 (Fed. Cir. 2014).

In identifying the structure, “that the disputed term is not limited to a single structure does not disqualify it as a corresponding structure, as long as the class of structures is identifiable by a person of ordinary skill in the art.” *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1322 (Fed. Cir. 2004) (“‘PWM circuit’ does not reference a specific circuit structure,” but “‘PWM circuit’ references a discrete class of circuit structures that perform known functions.”). And the same corresponding structure may perform the functions of multiple means-plus-function limitations. *Rodime PLC v. Seagate Technology, Inc.*, 174 F.3d 1294, 1305 (Fed. Cir. 1999) (“[A] particular means may perform more than one function.”).

Structure corresponding to the claimed function can include prior art structures, even where the specification discloses “novel structures,” “disadvantages of the prior art,” and “reveals inventive features … that are meant to overcome those

disadvantages.” *Clearstream Wastewater Sys., Inc. v. Hydro-Action, Inc.*, 206 F.3d 1440, 1444 (Fed. Cir. 2000) (“It was [an] error for the district court to conclude that the means limitations ... could only cover new elements of the preferred embodiment”). “Combination claims can consist of new combinations of old elements or combinations of new and old elements .... Because old elements are part of these combination claims, claim limitations may, and often do, read on the prior art.” *Id.* at 1445.

Where a defendant mounts a “challenge to a claim containing a means-plus-function limitation as lacking structural support,” clear and convincing evidence is required to show “that the specification lacks disclosure of structure sufficient to be understood by one skilled in the art as being adequate to perform the recited function.” *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1376-77 (Fed. Cir. 2001).

## 2.     **“Optical Element Configured to Detect” ('443 Patent, claim 13)<sup>8</sup>**

The Court construed this term as means-plus-function and held that the corresponding structure was detectors “408 and/or 413” in the specification (and structural equivalents thereof), but the Court invited further briefing as to whether the corresponding structure should be *either* detectors 408 or 413 (and structural

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<sup>8</sup> BEC hereby withdraws claims 17 and 18 of the '443 Patent, which also included the “optical element configured to detect limitation,” obviating the need for construction of that term in those claims.

equivalents) or whether the structure should be *both* detectors 408 or 413 (and structural equivalents).

The specification plainly describes having either one or both of a forward scatter detector and a side scatter detector. The specification explains that detector 408 detects “forward scatter and remaining light” and that detector 413 detects “side scatter” and, thus, either one is sufficient to perform the claimed function of “detect scattered light emitted by the particle in the flow channel and illuminated by a light source.” In the specification, “the optical sensing subsystem includes *one or more detectors*,” where “such detectors *may* include: detectors in line with the light beam (Forward Scatter or FSC)” or “detectors perpendicular to it (Side Scatter or SSC).” “According to some exemplary embodiments,” the flow cytometer includes “*a* detector for measuring axial light loss produced by an object in the viewing zone by detecting light reflected by the concave mirror.”<sup>582 Patent 5:66-6:6.</sup> Detector 408 is initially described in connection with Figure 37, which is said to be “in accordance with some embodiments of the present disclosure.” There is no mention of detector 413 in connection with Figure 37 or the corresponding written description. Detector 413 is then introduced as “*a second* light detection system 413 in accordance with some embodiments of the present disclosure,” thereby making clear it is a separate detector from 408. In describing Figure 38, which includes both detectors 408 and 413, the specification states that “the FSC and remaining light propagating from the

viewing zone may be ... detected by the detector 408,” “while the side-scattered fluoresced light **may** be ... detected by the **second** light detection system 413.”

Thus, the specification makes clear that, while each of detectors 408 and 413 is independently capable of performing the claimed function, both are not required because the specification describes them in separate parts of the specification, in separate figures, and repeatedly uses optional language (“may,” “second,” “one or more”) in reference to detectors, including detectors 408 and 413. The Court should hold that the corresponding structure is either detector 408 or detector 413 (and structural equivalents). *See Ex. D (Schaafsma Supp. Decl.) ¶¶ 28-31.*

### 3.     **“collimating optical element” ('582 Patent, cls. 1, 6, 14, 18, 20, 21; '106 Patent, cls. 1, 13)**

The specification could not be clearer in terms of explaining and linking the structure that corresponds to the claimed functions recited in the claims. For example, the specification provides for a “first optical element [that] collimates a beam of light received from an extended light source, ... [and] magnifies the extended light source ... to an image having a size similar to the effective cross section of the first optical element thereby creating a collimated light beam thereby creating a collimated light beam between the first optical element and its image. ....

In one embodiment of a WDM, the first optical element is a **lens** ...” '582 Patent at 4:34-62. Indeed, the specification also uses the **exact** same words recited in the claims—“collimating optical element”—and ties the use of lenses to the claimed

functions: “[a]s depicted in FIG. 25, a collimating optical element, in this case an achromatic doublet *lens* 902, may capture the light from source 901, and project a magnified image of the object.” ’582 Patent at 44:58-61, Figure 25; *see also* ’582 at Abstract (“The WDM includes an extended light source providing light that forms an object, a collimating optical element that captures light from the extended light source and projects a magnified image of the object as a first light beam ....”); 44:58-46:59. During prosecution of the ’106 Patent, the Examiner confirmed that the specification links the claimed function of the “collimating optical element” to the disclosed structure, namely, an achromatic doublet lens. Ex. C (Examiner Interview Summary) at 4. Thus, the structure corresponding to the claimed functions is a lens, or structural equivalents thereof. In the alternative, and although the specification contemplates a “lens” as performing the claimed function, the Court could adopt as corresponding structure the specific lenses that are recited, *i.e.*, achromatic doublet lens or singlet lens (and structural equivalents thereof).

Cytek’s arguments to the contrary have no merit. There is no dispute that a lens can be configured to collimate a beam. Under Federal Circuit law, there is no need to disclose the specific implementation details that “enable” the claimed function or provide operational details. *See Tech. Licensing Corp.*, 545 F.3d at 1338; *Asyst*, 268 F.3d at 1371. Indeed, Cytek’s expert admits that a POSA understands the additional detail necessary to “enable” a lens to collimate light. *See, e.g.*, Ex. 28

(Ilkov Decl.) ¶¶ 108, 114, 116; Ex. 90 (Ilkov Sur-Reply Decl.) ¶¶ 48-49. That Cytek's expert was readily able to articulate additional implementation details from the lens to collimate light confirms the disclosed lens is sufficient structure. And with respect to the asserted claims that also require the "collimating optical element" to "project a collimated beam including a first image" or "project a first image" (i.e., '582 Patent, claims 14, 20), Cytek's dispute is not about whether the specification discloses structure to accomplish that function—it clearly does—but about the proper construction of image, confirming the same conclusion applies to those claims as well. *See* Ex. D (Schaafsma Supp. Decl.) ¶¶ 32-38.

#### **4. "collecting optical element" ('106 Patent, cl. 1, 2, 13)**

There is no dispute that objectives and composite microscope objectives are widely used and well-understood optical structures for collecting and focusing light. The specification—no less than five separate times—clearly links and associates an "objective" or "composite microscope objective" with those functions and does so generally and without reciting *any* specific features of those objectives. '582 Patent at 2:41-51, 8:41-44, 10:24-26, 23:7-11, 27:59-28:13, Figure 1; *see also id.* at 32:49-33:5, 34:9-14. In connection with Figure 1, for example, the specification describes a "composite microscope objective 60 gathering and imaging light scattered and/or fluoresced by particles in the viewing zone" and the fiber "receives" light "that the

composite microscope objective 60 gathers and images.” *Id.* at 27:59-28:13, Figure 1.<sup>9</sup>14.

Cytek’s claim that the disclosure of an objective or composite microscope objective does not “provid[e] any structure that performs the claimed function,” Br. 101, relies on extrinsic evidence and is directly contrary to the express disclosures in specification, which expressly confirms the structure is sufficient to perform the claimed function. No additional details are needed because an objective or composite microscope objective is itself a structural component that performs the claimed function.

And while the specification goes on to provide additional details regarding certain specific types of objectives in connection with certain “exemplary embodiments” or “additional aspect[s] of the disclosure,” the specification also makes clear that those additional details are optional. For example, the specification states several times that “[t]he composite microscope objective **may** include a concave mirror upon which scattered and fluoresced light impinges,” and twice notes that “the aberration corrector plate **is not necessary** when providing a concave mirror

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<sup>9</sup> Both parties agree that “imaging” encompasses focused images, but they dispute whether an “image” is a “representation of an object” (as BEC contends) or whether it is necessarily limited to “a pictorial representation of an object (e.g., light source) where rays of light from points on the object are focused to a corresponding point” (as Cytek contends).

shape allowing a sufficient imaging of the light.” ’582 Patent at 8:6-11, 9:10-15, 53:54-59. Thus, the structure corresponding to the claimed functions is an objective or composite microscope objective (and structural equivalents thereof).

In the alternative, and to the extent the Court adopts Cytek’s corresponding structure, the Court should at least also include an achromat—a well known lens—as a separate structure, which is plainly described directly in the specification as a type of “microscope objective” linked to the claimed functions and as to which there is no dispute that it performs the claimed function. ’582 Patent at 32:49-33:12. Cytek’s argument that the apochromat is not within the disclosed structure because it is identified as a prior art structure, Br. 101-102, is directly contrary to Federal Circuit law, as noted above. *See Clearstream*, 206 F.3d at 1444 (means-plus-function structure can include prior art structures even where specification identifies “disadvantages of the prior art” and “reveals inventive features … that are meant to overcome those disadvantages”). The key aspects of the inventions claimed in the Asserted Patents include the use of a WDM and APDs in a flow cytometer, which are the focus of the claims reciting the “collecting optical element”; these claims are not focused on a novel design for a “collecting optical element.”<sup>10</sup> *See* Ex. D (Schaafsma Supp. Decl.) ¶¶ 39-44.

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<sup>10</sup> There is also a separate patent directed to the novel composite microscope objective, *see* U.S. Patent No. 10,209,174.

**5. “focusing optical element” ('582 Patent, cl. 1, 3, 17, 18, 26; '106 Patent, cl. 14)**

The specification clearly and unambiguously links a lens or focusing lens to the claimed functions. In Figure 25, for example, elements 905, 908, 918, 919, 920 and 921 are each described as a “focusing lens” that can “readily focus[] down to a spot smaller than that of the beam of light received by the WDM 90 at location 901,” and “can be easily focused down to a spot smaller than that of the light source at 901,” and “the spots of light produced by focusing lenses 905, 908, 918, 919, 920 and 921 are all smaller than the source of the beam of light, and therefore can be easily captured by small area APD’s.” '582 Patent at 44:58-45:65, 46:17-22; *see also* Figure 25, 44:58-46:50. Thus, the structure corresponding to the claimed functions is a lens or focusing lens and structural equivalents thereof.

Cytek’s arguments to the contrary suffer from the same flaws noted above. Br. 112. That is, the specification need not identify all details of the structure that performs the function because those implementation and enabling details would be known to a POSA, as Cytek’s expert concedes. *Tech. Licensing Corp.*, 545 F.3d at 1338; *see also* Ex. 90 (Ilkov Sur-Reply Decl.) ¶¶ 64-65. Because Cytek concedes that the specification discloses a lens as structure that is linked to the function of focusing light, Br. 106-107, 112, its other arguments should be rejected. Nor is there any support for Cytek’s attempt to inject into the structure a requirement that the lens “is of a size that captures all light rays.” The claim includes no such requirement.

And not only is that description functional (as opposed to structural), but Cytek is also unable to identify any disclosure in the specification establishing that capturing all light rays is necessary to focus light—it is not. *See* Ex. D (Schaafsma Supp. Decl.) ¶¶ 45-50.

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**CERTIFICATE OF SERVICE**

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